Movement Disorders
CLINICAL PRACTICE
EDITORIAL COMMENTARY

Blocking Phenomena in Gilles de la Tourette Syndrome

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Gilles de la Tourette syndrome (GTS) is a complex neuropsychiatric spectrum disorder with tics as the defining feature. Tics are excess movements (or noises) that resemble voluntary actions, but appear repetitive and intrusive, as they are typically not embedded in a certain context. Although, tics most commonly are located on the eyes, face, and head, in principle, tics can present as any movement (or movement pattern). Tics therefore, exhibit high phenomenological variability and differ from patient to patient. Seldom, however, patients with GTS may also exhibit a variably brief, recurrent cessation of motor output. This particular type of behaviors has been labeled "blocking tics,"[1] but besides isolated cases, as the one reported by Rizzo et al.[2] in this issue of the *Movement Disorders Clinical Practice*, it has not been widely acknowledged in the medical literature.

We would like to refer to these behaviors as *blocking phenomena*, rather than *blocking tics*, in order to include further (negative) motor behaviors that may be encountered in patients with GTS, not only within the context of tics. In our experience, three different categories of negative or blocking phenomena should be distinguished in patients with GTS: (1) blocking phenomena in the context of tics; (2) blocking phenomena related to obsessive-compulsive behavior/disorder (OCB/OCD); and (3) blocking phenomena, which may be of a functional nature.

Blocking phenomena in the context of tics have been used to describe two different types of events. On the one hand, patients may demonstrate a brief interruption of voluntary (non-tic) motor output during prolonged, and usually severe, dystonic tics. This is the expression of an involuntary motor behavior that takes precedence over the execution of voluntary actions (see Video S1, Segment A). On the other hand, patients may show a brief and sudden cessation of all motor output (or absence of movement initiation), in the maintenance of posture against gravity, as part of their tic behaviors (see Video S1, Segment B). These types of events may also be classified within the spectrum of negative motor phenomena, the clinical significance of which has been recognized in pathological conditions, such as cataplexy, types of epilepsy, negative myoclonus, and freezing of gait.[3] In the absence of research data with regard to this type of phenomena in GTS, their pathophysiological basis remains unclear. One could speculate an abnormal interaction between tonic (proactive) and phasic motor inhibition to balance strong tic and voluntary action-related premotor signals leading to motor blocks in these patients.[4] This could explain both block-related action initiation difficulties as well as action interruptions. In our experience, tic-related blocking phenomena are rare and usually encountered in the more severe end of the clinical GTS spectrum. They usually fluctuate, and wax and wane parallel to tic frequency and severity.

Worth noting is that some patients may experience this second type of blocking phenomena related to tics selectively for vocalizations (see Video S1, Segment B). In the absence of childhood-onset fluency disorder,[5] these patients develop tic-related difficulties initiating speech or completing sentences - similar to stuttering or cluttering - leading to severe dysfluency and communication problems.[6,7] Although no formal study has assessed the prevalence of the different types of tic-related blocking phenomena, we have encountered this latter group of patients more often.

Blocking phenomena in GTS may also be encountered in the context of OCB/OCD. These blocking phenomena may phenomenologically resemble tic-related blocks, but have a different underlying cause. Here, obsessions and covert compulsions (eg., mental repetition of certain words or numbers), rather than tics, lead to manifestation of these negative motor behaviors. According to our clinical experience, OCB/OCD related blocking phenomena are most often related to covert "just right phenomena," counting, and checking.

Finally, blocking phenomena have been described in the context of functional tic disorders.[8] Here, the occurrence of functional tics is not naturally embedded in the execution of voluntary actions, as in the majority of organic tics, but interrupts the ongoing voluntary motor output. We believe this happens, owing to the interference caused by competing (vol-

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untary) motor signals. Patients of this diagnostic category will rarely exhibit complete motor arrests, although this possibility cannot be excluded. Of note, in some patients organic and functional tics may co-exist and, therefore the recognition between the different phenomena may be particularly challenging.

To conclude, we provide a list of causes for the presence of blocking phenomena in GTS. These include blocking phenomena related to tics, OCB/OCD, and functional neurological symptoms. We believe that the differential account of this type of phenomena will facilitate recognition and accurate diagnostic labeling of similar, but causally distinct, behaviors within the psychopathological spectrum of GTS. We also hope that future research will enquire for further clinical and pathophysiological aspects of this rare and certainly underexplored field of negative motor phenomena in GTS.

Author Roles

A: Drafting/revising the manuscript for content, including medical writing for content. B: Acquisition of data. C: Study supervision or coordination.

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Supporting Information

A video accompanying this article is available in the supporting information here.

Video 1. Segments A and B: Tic-related blocking phenomena in a 23-year-old male patient with severe GTS, including complex motor and vocal tics and comorbid attention deficit hyperactivity disorder (ADHD). Segments A: Manifestation of a prolonged dystonic tic, which maily affects the right arm and leads to blocking of voluntary motor output. Segments B: Prominent difficulties initiating speech and/or completing sentences with several brief intermittent blocks of all motor output.

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